

Exploration & SPACE Communications

NASA's CIS Office: Embracing the Aerospace Community Through Strategic Engagement

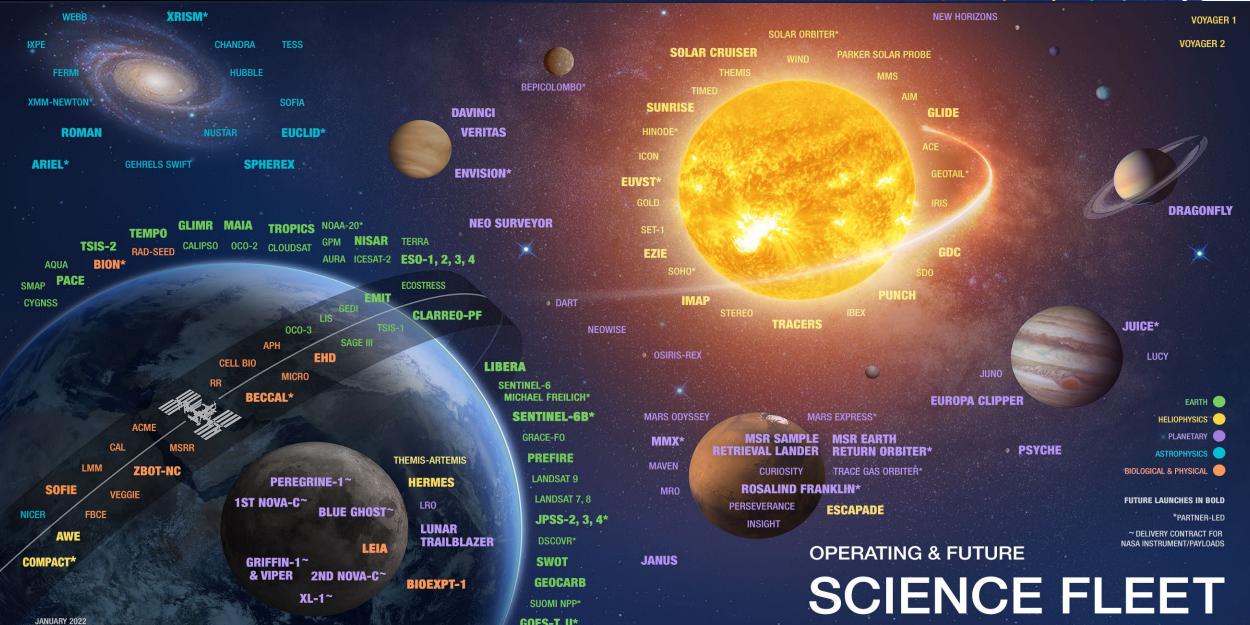
Ruma Das | CIS Deputy Chief | February 2023

More than you ever imagined...



Exploration





NASA's Space Communications Networks





Network Regimes



Regime

NEAR SPACE

DEEP SPACE



Range from Earth

Earth Proximity
Below 36,000 km

Lunar Proximity 70,000 km from center of Moon Earth-Moon L1/L2 61,000 km from center of Moon Cislunar 455,000 km Sun-Earth L1/L2 1.5M km

Deep Space > 2M km

Notation

Near Space is considered from 80 km to 2 million km from the Earth

> 2M km from Earth is considered Deep Space

Our Network: The Near Space Network





Our Goal: Partnerships & Interoperability

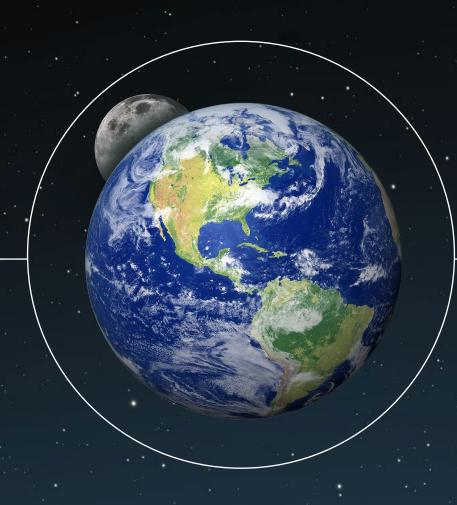


COMMERCIAL

PUBLIC / PRIVATE PARTNERSHIPS

Embracing the expanding aerospace industry to bring new expertise and cost savings to the government.

NASA + INDUSTY



GOVERNMENT

AGENCY PARTNERSHIPS

Collaborating with national and international agencies for interoperability and maximized capabilities

NASA + OGAs

Embracing the Aerospace Community

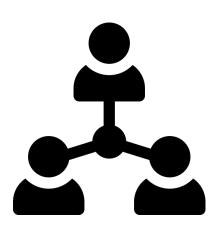


The Commercialization, Innovation, & Synergies Office:

- Garners new commercial providers for the Near Space Network.
- Fosters relationships with industry, government agencies, and mission teams.
- Encourages interoperability by engaging with the broader aerospace community.
- Gathers information about current and upcoming space communications technologies and capabilities.
- Hosts interactive and collaborative exchanges to increase knowledge and idea sharing in the space communications and navigation sector.







Who Do We Engage?



MISSION ENGAGEMENT

Who: Mission Teams

How: Promoting NSN Services and Capabilities

Result: Onboarding Missions



INDUSTRY ENGAGEMENT

Who: Large and Small Aerospace Companies

How: Hosting numerous events and 1:1 meetings

Result: Incorporating Commercial Capabilities



CIVIL & DEFENSE SPACE PARTNERSHIPS

Who: Other Government Agencies

How: Collaborative Sessions

Result: An Interoperable Space Ecosystem



Requests for Information

NASA

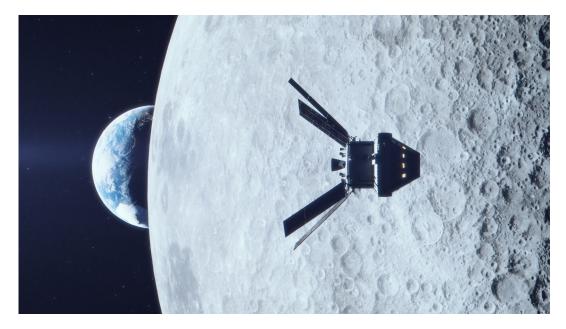
Track the Artemis I Mission

Goal: Understand non-NASA tracking capabilities on a non-interference basis

Released: August 2022

Status: 20 organizations responded –

undergoing data analysis



Low-Cost Optical Terminals

Goal: Understand industry's interest in contributing to optical ground terminals or experimenting with an existing one.

Released: January 2023

Status: Open to responses. Due March 6, 2023.



Broad Agency Announcements (BAA)



Near Space Communications Capabilities NextSTEP-2 BAA

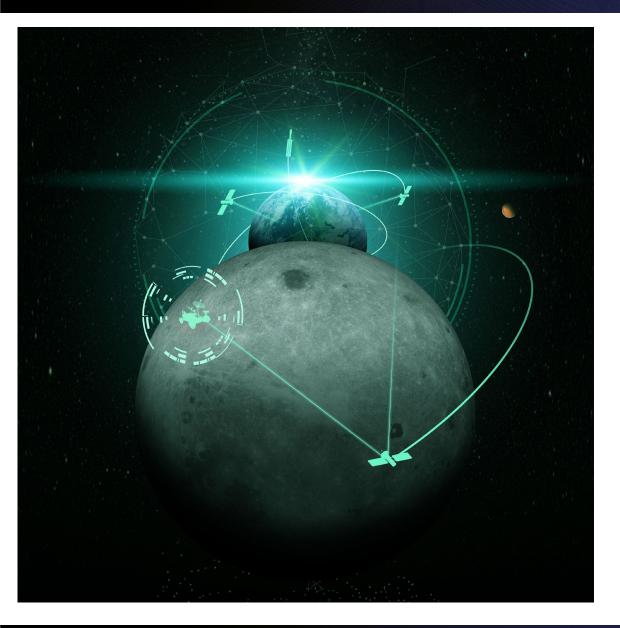
- **Goal**: to develop capability studies to explore and demonstrate communications and navigation services in support of Artemis missions to the Moon.
- Awarded under the <u>Next Space Technologies for Exploration Partnerships-2 (NextSTEP-2) Broad Agency Announcement (BAA) Appendix O.</u>
- **Status**: Two companies selected: Kongsberg Satellite Services (KSAT) USA and the SpaceLink Corporation.

Another CIS-sponsored BAA will be released in spring 2023.



Requests for Proposal





Draft Request for Proposal: Near Space Network Services

Goal: Solicits industry space relay and/or direct-to-Earth communications and navigation services for the Near Space Network.

Status: Formal Request for Proposal coming in 2023.

Draft RFP: https://bit.ly/3JT0hm2

Engagement: Two Industry Days conducted in 2022. Over 300 people attended.

Engagement Highlights – Industry





The industry engagement team hosts events to hear from and talk to the aerospace community about new capabilities and potential provider integration into the network.



Topics Included:

- RF Compatibility Testing and Future Innovation
- Integration of Optical Ground Terminals into Network Operations
- Optical Communications Standards
- Delay/Disruption Tolerant Networking (DTN)

Supported NASA's first annual Delay/Disruption Tolerant Networking (DTN) Face-to-Face.

Presented to over 100 participants from 44 companies, agencies, and teams.

Explored state-of-the-art DTN solutions from industry and government.

- Lunar Interoperability Standards
- Digital Signal Processing in the Cloud (Software Defined Radios in Cloud)
- Cislunar Position, Navigation, and Timing
- Lunar 3GPP / 5G

Hosted a OneLink keynote presentation and a Reverse Industry Day to provide broad market analysis.

Brought together over 120 industry professionals and conducted 18 one-on-one sessions with interested companies.

Engagement Highlights – Civil and Defense





The civil and defense space partnership team fosters relationships with national and international government agencies to establish space act agreements and promote network capabilities.



Engaged over 300 individuals from other government agencies by hosting:

- 7 Connection Sessions events
- 30 one-on-one briefings

Topics Included:

- Wideband Networking
- Lunar Networking
- Commercial Space Partnerships
- Commercializing Communications

















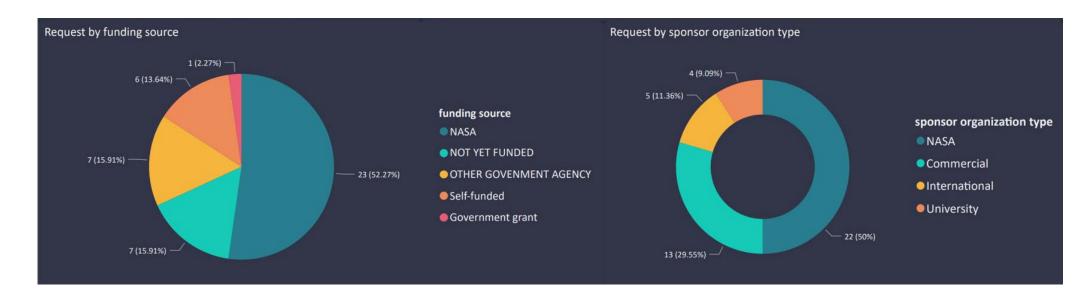
Engagement Highlights – Mission Teams





The mission engagement team educates upcoming and existing missions on Near Space Network services and new technology infusion efforts that will benefit the user.





- Received 73 Service Inquiry Requests and forwarded those to the NSN Advanced Planning Team for analysis.
- Hosted 14 Mission Engagement Sessions to educate stakeholders.
- Requests were from domestic and international organizations with several different types funding sources.

Engage with Us



How to engage with CIS:

- Join our distribution list:
 - Get updates about RFPs, RFIs, BAAs, and all of our engagement events.
- Inquire about services through our "Service Inquiry Form"
- Reach out about specific questions or topics to our email nasa-commercialsynergies@mail.nasa.gov

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